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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,446	11/08/2001	Wolfgang Schneider	VAW-5	5083

21890 7590 12/02/2005

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EXAMINER

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ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 12/02/2005

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/986,446
Filing Date: November 08, 2001
Appellant(s): SCHNEIDER ET AL.

Charles Guttman
For Appellant

EXAMINER'S ANSWER

MAILED

DEC 02 2005

GROUP 1700

This is in response to the appeal brief filed on 10/25/05.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Claimed Subject Matter*

The summary of the claimed subject matter contained in the brief is correct.

(6) *Grounds for rejection to be reviewed on appeal*

The appellant's statement of the grounds for rejection in the brief is correct.

(7) *Claims Appendix*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) *Evidence Relied Upon*

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) *Grounds of Rejection*

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 12, 13, 21, 24 and 22(12,13,19-21) {Claims 22 as it depends from claims 12, 13, and 19-21} and 23 (12,13,19-21) are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 07-207357 in view of Gesing et al (US 4,790,873).

JP teaches a device for filtering and adding grain refining material to metal melt comprising a first filter, a grain refining material feed downstream of the first filter and a second filter downstream of the first filter as in claim 12 (see abstract and specification); with the second filter a porous filter medium. However, JP-357 does not teach the second filter as a deep-bed filter. Gesing 873 teaches a deep bed filter as the second filter (see fig 7-9). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Gesing in the teaching of JP for the device for a metal melt because it would help trap and hold metal wettable inclusions, inline treatment, and for continuous operation (Gesing col 1 lines 7-19, col 4 lines 16-25, col 7 lines 1-10).

First filter can be a cake filter as in claim 13 (see specification of JP).

JP teaches a method of filtering, by filtering through a first filter, adding a grain refiner and then filtering through a second filter as in claim 24 (see abstract and specification)

Claims 21-23: JP teaches all the limitations of claim 12. Instant claims add further limitations which are not taught by JP, but taught by Gesing as follows:

Second filter is loosely filled as in claim 21 (see fig 7-9). Gesing teaches electrically heated filter as in claims 22(12,13, 19-21) and 23 (12,13, 19-21) (col 7 lines 7-10).

2. Claims 14-17, 22 (14-17) and 23 (14-17) are rejected under 35 U.S.C. 103(a) as being unpatentable over JP (357) in view of Gesing et al (US 4,790,870) as in claim 12 above and further in view of Dore (US 4,113,241).

Claims 14-17 add further limitations of first filter being a ceramic foam plate, plate thickness and that it is being sintered. Dore teaches a sintered ceramic foam filter plate for metal melt filtration (abstract, col 6 lines 10-20). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Dore in the teaching of JP(357) in view of Gesing for more efficient filtration (Dore col 6 lines 21-34).

Gesing in view of Dore is not specific on the thicknesses of the filter elements as in instant claims 15 and 16 . However, it would be obvious to one of ordinary skill in the art at the time of invention to provide sufficient thickness to have enough strength without compromising on pressure drop. [Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955)].

Gesing teaches electrically heated filter as in claims 22(14-17) and 23 (14-17) (col 7 lines 7-10).

3. Claims 18, 22 (18) and 23 (18) are rejected under 35 U.S.C. 103(a) as being unpatentable over JP(357) in view of Gesing et al (US 4,790,870) as in claim 12 above and further in view of Walker (US4,834,876).

JP in view of Gesing teaches electrically heated filter (Gesing: col 7 lines 7-10) as in claims 22 (18) and 23 (18), but does not teach a CVD deposited material on the filters as in instant claim 18. Walker (876) teaches heated filter elements for metal melt filtration, with CVD metal deposition for resistance heating of the element (col 2 lines 12-15). It would be obvious to one of ordinary skill in the art at the time of invention to use the teachings of Walker (876) to configure the filter elements to be heated for the purpose of heating the filters as taught by Gesing.

(10) Response to Argument

Appellant's arguments are directed at claim 12 and 24. Claim 12 is an apparatus claim, and claim 24 is for the process.

Claim 12 recites a device for filtering and adding grain refining agents to a metal melt which comprises a porous first filter, a deep-bed second filter and a grain refining material feed in between. The device is claimed as having a flow direction from the first filter to the second filter, and the first filter is configured to operate as a cake filter.

Claim 12 was rejected under 35 USC 103(a) as obvious over the JP-357 reference in view of Gesing'873. Both references teach the two-filter system with grain refining material provided in the middle.

JP-357 teaches a first filter that is configured to operate based on cake filtration (see paragraphs 8,10 and 11), a grain refining wire feed (para 12,16), and a second filter, which is a refractory porous filter (paragraph 9), or a tabular filter (para 16). Even though this reference was used in a 35 USC 103(a) rejection, this reference also anticipates the claim as follows: Appellant's claim 12 recites the structure of the device as a first filter comprising a porous filter medium, which is taught by the reference in paragraph 8,10 and 11; grain refining feed, which is a wire feed, taught in paragraph 12; and the second filter as a porous filter medium in the form of a deep bed filter, which is taught in paragraph 9. The reference does not specifically state whether 'the second filter' is "in the form of a deep-bed filter". However, giving the claims the broadest reasonable interpretation in the light of the specification, the appellant's specification discloses the second filter as "porous medium" in page 5, 3rd paragraph, and the deep bed filter is further described in the 4th paragraph as "[I]n view of the low impurity load, this deep bed filter can have considerably smaller dimensions than those normally required when deep-bed filters alone are used for filtration". Thus the second filter, according to appellant's specification can be a porous filter medium with considerably smaller dimensions, and the JP-reference's teaching of the second filter anticipates the claim. Deep bed filter is only a porous medium with depth for filtration, as opposed to surface filtration. Refractory porous filters are depth filters, which meet the claim, and

any phenomena of surface filtration happening with aluminum melt having Al oxides (as described in paragraph 9 of the JP-reference) is a process issue, which has no particular bearing on the device claim 12.

Limitations in claim 12, such as “for filtering and adding grain refining” and “configured to operate based on cake filtration” are functional or intended use language, which the filter of the JP reference is capable of.

Gesing teaches two different embodiments (col 3 lines 2-15). The second embodiment teaches filtering molten metal with a non-metal wettable filter followed by a metal wettable filter (col 3 lines 14,15 and col 5 line 52 –55). The non-metal wettable filter can be tabular or bed-type (col 6 lines 26-40) which forms filter cake. Gesing teaches packed bed filter as preferred for the metal wettable filter (col 4 lines 16-24). Titanium boride graining refining material is used with the metal wettable filter as a middle layer (col 2 lines 49-55, col 3 lines 60-68; figures 7 and 8). Gesing, even though teaches havingt graining refining material between the two filters, does not teach a grain refiner feed structure as claimed.

JP reference does not teach a loose-bed filter for the second filter and Gesing reference does not teach a grain refiner feed. However the combination of the two references make a prima facie case of obviousness. Gesing ref provides the missing part, deep bed filter, of the JP reference. With regard to a motivation to combine, Gesing teaches filtering non-metallic and metal-wettable inclusions effectively (col 1 lines 7-18 and col 2 lines 57-63); the method is useful for in-line treatment, and to remove inclusions immediately before casting, and where low evolution of fumes is

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desired (col 1 lines 3-19). Another motivation to use the metal wettable filter (with packed bed as preferred) of Gesing is found in col 5 lines 55-68 – prevents accidental release of clustered inclusions during any surge in the metal flow. Thus Gesing reference provides sound motivations for combining the references.

Appellants' detailed arguments are addressed item-by-item below:

A. Appellants provide the following arguments alleging that the office has used hindsight reconstruction in rejecting the claims, which are addressed below:

(1) *...the special and very effective arrangement of locating a cake filter before the grain refining material feed... the attendant advantage are nowhere disclosed or suggested in JP'357 or US'873.* (page 9, 1st paragraph of the brief) [Italics added] In response, JP teaches this arrangement and spells out the advantages in paragraph 16. The mechanism of filtration is "surface filtration" or cake filtration – see JP paragraphs 10 and 11.

(2) *A deep bed filter is inherently very effective and is not taught at all in JP'357* (page 5, 3rd para of brief) [Italics added]: The examiner respectfully disagrees. Giving the broadest reasonable interpretation for claim 12 in the light of the specification, the examiner now believes that the JP-357 reference actually anticipates claim 12, as shown supra. However, the Gesing reference is useful to overcome any doubts about the JP-reference's teaching of the second filter as 'deep-bed filter' in the light of appellant's specification.

Appellants have failed to establish a hindsight reasoning by these arguments. It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

B. Appellants allege that the references use totally different arrangements:

(1) JP'357 and US'873 describes a totally different arrangement (page 9 3rd paragraph of brief): Examiner respectfully disagrees. JP teaches a first and a second filter medium with a grain refining feed in the middle as claimed. US'873 teaches a first filter bed, grain refining layer and a second filter bed. Thus the generic structure is the same. The teaching of the '873 reference re 'the metal melt comprising metal-non-wettable and metal-wettable impurities' is part of the process of filtration and in no way affect the patentability of the device claim 12. On the other hand, '873 reference's teaching of using the loose-bed filter for effectively filtering the metal melt with wettable and non-wettable impurities would be a good motivation to combine the teachings of the references.

(2) *[A]ccording to the present application, these impurities or inclusions should not reach the first filter, because this would reduce the efficiency of the first filter* (3rd paragraph of page 9 of the brief) [Italics added]: re the inclusions not reaching the first

filter, problems associated with inclusions reaching the first filter is taught by the JP reference (paragraphs 14-16).

(2) *US'873 teaches that even before the first filter, there exist metal wettable inclusions in the metal melt...*: (page 10 2nd para of brief) [Italics added]: this is not relevant because the reference is not used for this particular teaching, but for a totally different reason. With regard to the US'873 having two steps, and metal wettable inclusions in the metal melt, and adding borides (page 6, 2nd para of brief), these are process related; therefore not relevant to the issue: the claim is for a device and is open-ended. It may also be noted that molten aluminum would inherently have metal wettable inclusions, as taught by both the JP (para 10-12) and Gesing references, at least from scrap or recycle in the melt. In addition, claim 12 is for the device, this is a process step, which has no bearing on the claimed invention.

(3) [Gesing '873] *Additionally, all inclusions ... metal wettable and non-wettable..are filtered by the second filter*: (page 10 2nd para of brief) [Italics added]: this is not entirely true: at least the second embodiment of the Gesing reference has the non-wettables filtered by the first filter. Moreover, this argument is also not relevant because the claim is for a device and is open-ended; Gesing ref is used for its teaching of the deep-bed filter; any additional advantage or feature of the deep bed filter or process steps taught by the ref does not preclude it as a reference.

(4) [Gesing'873] *...molten salt layer creates salt droplets..*(page 10 3rd para of brief) [Italics added]: Again, additional features in the secondary reference does not make it any less effective. Gesing is used for its teaching of the deep-bed filter.

(5) *JP'357 teaches that the second filter usually clogs very fast...That is why JP'357 discloses only cheap plate-filters are use as the second filters rather than more expensive deep-bed filters.* (2nd paragraph, page 11 of brief) [Italics added]: The reason why JP uses a tabular filter as the second filter is because it is cheap and can be easily replaced (para 16). This teaching of the JP-reference is a preferred embodiment (see JP-paragraph 16). As shown above, the JP reference teaches porous filter media similar to what is disclosed by the applicant, and therefore, would anticipate claim 12.

In case the teaching of the refractory porous filter of JP'537 is not sufficient for the claimed 'deep bed filter' for the second filter, the office has a secondary reference in combination. If, in this argument, appellant is implying that the appellants' motivation is different, the motivation for the use of the secondary reference may be different from that of the appellants'. The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Also, a teaching of preference based on cost is not teaching away and is not considered as a discouragement for combining the references. *In re Farrenkopf*, 713 F.2d 714, 219 USPQ 1 (Fed. Cir. 1983) (Prior art reference taught that addition of inhibitors to radioimmunoassay is the most convenient, but costliest solution to stability problem. The court held that the additional expense associated with the addition of inhibitors would not discourage one of ordinary skill in the art from seeking the convenience expected therefrom.).

Further in response to the argument that arrangements are different, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Thus, appellants' argument that the arrangements are different and therefore not combinable also failed to rebut the prima facie case of obviousness.

Further, with regard to the appellants' arguments on the references having additional elements, features or process steps: The transitional term "comprising" [in the claim], which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., > *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1368, 66 USPQ2d 1631, 1634 (Fed. Cir. 2003) ("The transition comprising' in a method claim indicates that the claim is open-ended and allows for additional steps.");< *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) ("Comprising" is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) ("comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts").

With respect to the rejection of Claims 14-17 and 22-23 over JP'357 in view of US'873 and US241: No further arguments presented other than Appellant's arguments based on the rejection of claim 12.

With respect to the rejection of claims 18 and 22-23 over JP'357 in view of US'873 and further in view of US'876: No further arguments presented other than Appellant's arguments based on the rejection of claim 12.

In summary, anticipation is the ultimate of obviousness; the arguments set-forth by the appellants are mostly not commensurate with the scope of the rejection or the claims, and attack the references individually. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

(11) Evidence Appendix: None

(12) Related Proceedings Appendix: None.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Patent Examiner
November 17, 2005


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